

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 5, and 9-13, and cancel claims 2-4 and 8, as set forth in the listing of claims that follows:

1. (CURRENTLY AMENDED) A rotary position sensor having an axis of rotation, comprising:

a magnet assembly having first and second poles wherein a working air gap is provided between the first and second poles; the working air gap having a nonuniform magnetic field which is substantially symmetric with respect to an imaginary line between the first and second poles, further wherein the nonuniform magnetic field is substantially symmetric with respect to a line passing through the axis of rotation and perpendicular to the imaginary line;

a magnetosensitive device having a reference point, wherein the reference point is located within the working air gap; the magnetosensitive device further having a reference direction, the reference direction being oriented substantially perpendicular to an imaginary plane passing through the reference point and the axis of rotation;

wherein the axis of rotation is located substantially midway between the first and second poles along the imaginary line;

wherein the axis of rotation to the reference point is a first selected distance greater than zero; and

wherein the working air gap is a second selected distance; and
the rotary position sensor not having ferromagnetic flux shapers between the first and second poles.

2-4. (CANCELED)

5. (CURRENTLY AMENDED) The sensor of claim 31, wherein the magnet assembly further comprises a magnetic element selected from the group consisting of a permanent magnet arc and a ring magnet;

6. (ORIGINAL) The sensor of claim 5, wherein the magnet assembly further comprises a flux carrying ring; and means for affixing the magnetic element to the flux carrying ring.

7. (ORIGINAL) The sensor of claim 6, wherein the magnetic element is composed of $\text{Sm}_2\text{Co}_{17}$.

8. (CANCELED)

9. (CURRENTLY AMENDED) The sensor of claim 35, wherein the first selected distance is greater than about 0.4 mm.

10. (CURRENTLY AMENDED) The sensor of claim 35, wherein the first selected distance is greater than about 0.8 mm.

11. (CURRENTLY AMENDED) The sensor of claim 35, wherein the first selected distance is about 2% to about 40% of the second selected distance.

12. (CURRENTLY AMENDED) The sensor of claim 35, wherein the first selected distance is about 8% to about 30% of the second selected distance.

13. (CURRENTLY AMENDED) The sensor of claim 35, wherein the first selected distance is about 15% to about 25% of the second selected distance.

14. (WITHDRAWN) The sensor of claim 1, further wherein the axis of rotation is located between the magnet assembly and the magnetosensitive device along a centerline of the magnet assembly passing through the working air gap.

15. (WITHDRAWN) The sensor of claim 14, the magnetosensitive device further having a reference direction, the reference direction being oriented substantially parallel to an imaginary line passing through the reference point perpendicular to the axis of rotation.

16. (WITHDRAWN) A rotary position sensor having an axis of rotation, comprising:

a permanent magnet having first and second poles;

a first pole piece wherein a portion thereof abuts the first pole, the first pole piece having a first pole piece face;

a second pole piece wherein a portion thereof abuts the second pole, the second pole piece having a second pole piece face;

wherein a working air gap is provided between the first and second pole piece faces;

a magnetosensitive device having a reference point wherein the reference point is located within the working air gap;

wherein the axis of rotation is substantially located between the permanent magnet and the magnetosensitive device along a centerline of the permanent magnet passing through the working air gap;

further wherein the axis of rotation to the reference point is a first selected distance greater than zero;

further wherein the working air gap is a second selected distance;

further wherein the permanent magnet has a side facing the working air gap;

further wherein the side to the axis of rotation is a third selected distance.

17. (WITHDRAWN) The sensor of claim 16, the magnetosensitive device further having a reference direction, the reference direction being oriented substantially parallel to an imaginary line passing through the reference point perpendicular to the axis of rotation.

18. (WITHDRAWN) The sensor of claim 17, wherein the first selected distance is greater than about 0.4 mm.

19. (WITHDRAWN) The sensor of claim 17, wherein the first selected distance is greater than about 0.8 mm.

20. (WITHDRAWN) The sensor of claim 17, wherein the first selected distance is about 4% to about 70% of the second selected distance.

21. (WITHDRAWN) The sensor of claim 17, wherein the first selected distance is about 10% to about 50% of the second selected distance.

22. (WITHDRAWN) The sensor of claim 17, wherein the first selected distance is about 13% to about 37% of the second selected distance.

23. (WITHDRAWN) The sensor of claim 20, wherein the third selected distance is from about 15% to about 70% of the second selected distance.

24. (WITHDRAWN) The sensor of claim 20, wherein the third selected distance is from about 25% to about 50% of the second selected distance.

25. (WITHDRAWN) The sensor of claim 20, wherein the third selected distance is from about 30% to about 35% of the second selected distance.

26. (WITHDRAWN) The sensor of claim 20, wherein the permanent magnet is composed of $\text{Sm}_2\text{Co}_{17}$.

27. (WITHDRAWN) The sensor of claim 20, wherein the first and second pole pieces are composed of ferromagnetic material.